Mutagenic Evaluation of Compound FDA 73-65, Monopotassium Phosphate Granular Food Grade-6/15/75

P25

LBI PROJECT #2468

MUTAGENIC EVALUATION OF

COMPOUND FDA 73-65

007778770

MONOPOTASSIUM PHOSPHATE
GRANULAR FOOD GRADE

SUBMITTED TO

FOOD & DRUG ADMINISTRATION
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
ROCKVILLE, MARYLAND

SUBMITTED BY

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JUNE 15, 1975

Litton BIONETICS

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EVALUATION SUMMARY

Compound FDA 73-65, Monopotassium Phosphate Granular Food Grade, did not exhibit genetic activity in any of the *in vitro* microbial assays employed in this evaluation.

DATE: June 15, 1975

SPONSOR: Food and Drug Administration, Contract Number 223-74-2104

SUBJECT: Evaluation of Test Compound 007778770, Monopotassium Phosphate Granular Food Grade, FDA-73-65

I. OBJECTIVE

The objective of this study was to evaluate the test compound for genetic activity in microbial assays with and without the addition of mammalian metabolic activation preparations.

II. MATERIALS

A. Test Compound

1. Date Received: August, 1974

2. Description: White granular powder

B. Indicator Microorganisms

The following strains of indicator microorganisms were used in the evaluation:

Yeast Strain: Saccharomyces cerevisiae, strain D4

Bacteria Strains: Salmonella typhimurium, strains: TA-1535
TA-1537
TA-1538

C. Reaction Mixture

The following reaction mixture was employed in the activation tests:

Component	Final Concentration/ml
1. TPN (sodium salt)	6 µM
2. Isocitric acid	49 µM
3. Tris buffer, pH 7.4	28 µM
4. $MgCl_2$	1.7µM
5. Tissue homogenate fraction	72 mg

D. Tissue Homogenates and Supernatants

The tissue homogenates and 9,000 x g supernatants were prepared from tissues of the following mammalian species: Mouse-ICR random bred adult males; rat-Sprague-Dawley adult males; and primate-Macaca mulatta adult males.

E. Positive Control Compounds

Table 1 lists chemicals for positive controls in the direct and activation assays.

TABLE 1

POSITIVE CONTROLS USED IN DIRECT AND ACTIVATION ASSAYS

Assay	Chemical[a]	Solvent	Probable Mutagenic Specificity
Nonactivation	Ethyl methanesulfonate	Water or saline	BPS[b]
	2-Nitrofluorene	Dimethylsulfoxide[c]	FS[b]
	Quinacrine mustard	Water or saline	FS[b]
Activation	Dimethylnitrosamine	Water or saline	BPS[b]
	2-Acetylaminofluorene	Dimethylsulfoxide[c]	FS[b]

[a] Concentrations given in the Results Section
[b] BPS = base-pair substitution; FS = frameshift
[c] Previously shown to be non-mutagenic

III. METHODS

A. Toxicity

The solubility, toxicity and doses for all chemicals were determined prior to screening.

Each chemical was tested for survival against the specific indicator strains over a range of doses to determine the 50% survival dose. Bacteria were tested in phosphate buffer, pH 7.4, for one hour at 37°C on a shaker. Yeasts were tested in phosphate buffer, pH 7.4, for four hours at 30°C on a shaker. The 50% survival curve and the 1/4 and 1/2 50% doses calculated.

If no toxicity was obtained for a chemical with a given strain, then a maximum dose of 5% (w/v) was used against the strain.

Unless otherwise specified, the doses calculated for the tests in buffer were applied to the activation tests. The solubility of the test chemical under treatment conditions is stated in the Results Section.

B. Plate Tests

In the nonactivation procedure, approximately 10^9 cells of a log phase culture of the bacterial indicator strains were spread over the surface of a minimal plate, and a measured amount of the test chemical was placed in the center of the test plate. In activation tests, the test chemical was added to the cells, and an aliquot of the mixture was spread on the surface of the test plate. The reaction mixture (0.1 ml) plus tissue extract was then spotted on the surface of the plate. Positive and solvent controls were included. All plates were incubated at 37°C for four days and then scored. Each compound (Test, Positive Control and Solvent Control) was done in duplicate. Concentrations of the positive control compounds are listed in the Results Section.

C. Suspension Tests

1. Nonactivation

Log-phase bacteria and stationary-phase yeast cultures of the indicator organisms were grown in complete broth, washed and resuspended in 0.9% saline to densities of 1×10^9 cells/ml and 5×10^7 cells/ml, respectively. This constituted the working stock for tests of a group of test chemicals and their respective controls. Tests were conducted in plastic tissue culture plates. Cells plus appropriate volume(s) of the test chemical were added to the wells to give a final volume of 1.5 ml. The solvent replaced the test chemical in the negative controls. Treatment was at 30°C for four hours for yeast tests and at 37°C for one hour for bacterial tests. All flasks were shaken during treatment. Following treatment, the plates were set on ice. Aliquots of cells were removed, diluted in sterile saline (4°C) and plated on the appropriate complete media. Undiluted samples from flasks containing the bacteria were plated on minimal selective medium in reversion experiments. Samples from a 10^{-1} dilution of treated cells were plated on the selected media for enumeration of gene conversion with strain D4. Bacterial plates were scored after incubation for 48 hours at 37°C. The yeast plates were incubated at 30°C for 3-5 days before scoring.

2. Activation

Bacteria and yeast cells were grown and prepared as described in the nonactivation tests. Measured amounts of the test and control chemicals plus 0.25 ml of the stock-cell suspension were added to wells of the Linbro plate containing the appropriate tissue fraction and reaction mixture. All flasks (bacteria and yeast) were incubated at 37°C in an oxygen atmosphere with shaking. The treatment times as well as the dilutions, plating procedures and scoring of the plates were the same as described for nonactivation tests.

D. Preparation of Tissue Homogenates and 9,000 x g Cell Fractions

Male animals (sufficient to provide the necessary quantities of tissues) were killed by cranial blow, decapitated and bled. Organs were immediately dissected from the animal using aseptic techniques and placed in ice-cold 0.25 M sucrose buffered with Tris at pH of 7.4. Upon collection of the desired quantity of organs, they were washed twice with fresh buffered sucrose and completely homogenized with a motor-driven homogenizing unit at 4°C. The whole organ homogenate obtained from this step was divided into two samples. One sample was frozen at -80°C and the other was centrifuged for 20 minutes at 9,000 x g in a refrigerated centrifuge. The supernatant from the centrifuged sample was retained and frozen at -80°C. These two frozen samples were used for the activation studies.

E. Data Recording and Reporting

Following the specified incubation periods all population plates were scored by an automatic colony counter and the results from each plate of a set were recorded, in ink, on data processing forms. All minimal or other types of selective media plates were hand scored and the results recorded along with the respective population data. Other relevant experimental data were recorded on experimental definition forms. For bacteria strains the number of colonies recorded from either the population or selective plates represents that number in 1 ml of test suspension plated. The numbers recorded for the yeast strain D4 represent the number in 0.5 ml of test suspension plated. The data were then processed and printed from a computer program.

IV. RESULTS SECTION

A. Solubility Properties of the Test Compound

1. Name or code designation of the test compound: 007778770
Monopotassium Phosphate Granular Food Grade

2. Test solvent: Saline

3. Solubility of the test compound under treatment conditions:
Insoluble under treatment conditions.

4. Additional comments: White granular powder

B. Toxicity and Dosage Determinations for the Test Compound

1. Test date for toxicity determination: April 11, 1975

2. The 50% survival level was determined for bacteria and yeast indicator organisms by conducting survival curves with the test compound at the following concentrations:

Percent Concentration (w/v or v/v)

10.0
1.0
0.1
0.01
0.001

3. Concentrations of the test compound used in the mutagenicity tests:

	Percent Concentration	
Dose	Bacteria	Yeast
1/4 50% Survival	2.5	2.5
1/2 50% Survival	5.0	5.0
50% Survival	10.0	10.0
Plate Tests	5.0	--

V. SUMMARY OF TEST RESULTS

Plate Tests

A. Name or code designation of the test compound: 007778770

B. Test date: April 21, 1975

C. Concentration of the test compound: 5.0%

Test	Species	Tissue	REVERTANTS/PLATE TA-1535 1	TA-1535 2	TA-1537 1	TA-1537 2	TA-1538 1	TA-1538 2
1. Non-activation								
Solvent Control	---	---	3	4	22	33	7	11
Positive Control[a]	---	---	>10³	>10³	138	133	146	138
Test Compound	---	---	8	3	21	17	9	10
2. Activation								
Negative Control	---	---	6	4	27	23	7	14
Solvent Control	---	---	10	12	36	43	16	18
Reaction Mixture Control	---	---	9	7	36	39	19	23
Positive Control[b]	Mouse	Liver	>10³	>10³	96	93	333	317
Positive Control		Lung	9	7	33	33	21	26
Positive Control		Testes	7	2	37	32	18	11
Positive Control	Rat	Liver	>10³	>10³	84	80	314	317
Positive Control		Lung	11	6	32	35	15	18
Positive Control		Testes	6	5	24	43	20	9
Positive Control	Monkey	Liver	>10³	>10³	97	93	111	155
Positive Control		Lung	8	5	32	38	13	15
Positive Control		Testes	8	2	28	33	12	8
Test Compound	Mouse	Liver	3	4	45	46	13	7
Test Compound		Lung	4	7	30	20	8	12
Test Compound		Testes	9	9	23	26	17	10
Test Compound	Rat	Liver	3	4	46	46	13	8
Test Compound		Lung	4	9	30	22	12	14
Test Compound		Testes	9	9	28	27	13	13
Test Compound	Monkey	Liver	3	5	46	49	13	9
Test Compound		Lung	4	7	23	18	10	12
Test Compound		Testes	9	9	19	22	13	9

a TA-1535 EMS 10 µl/plate
TA-1537 QM 20 µg/plate
TA-1538 NF 100 µg/plate

b TA-1535 DMNA 50 µM/plate
TA-1537 AAF 100 µg/plate
TA-1538 AAF 100 µg/plate

DATA TABLE TERMS AND ABBREVIATIONS

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
COMPOUND	Client designated compound number appears in this column.
TEST CODES	NAN = Nonactivation: Solvent Control NAP = Nonactivation: Positive Control NA1 = Nonactivation: Test Compound Dose 1 NA2, etc. = Reflects the other dose level(s) A+C = Negative Chemical Control A-C = Activation: Solvent Control ACP = Activation: Positive Control ACT = Activation: Test Compound A+T = Activation: Tissue Control LI = Liver Tissue Activation Fraction LU = Lung Tissue Activation Fraction KI = Kidney Tissue Activation Fraction TE = Testes Tissue Activation Fraction 1,2, etc. = Dose Levels
CONCENTRATION	All test compound dose levels are expressed as a whole number followed by an exponent (negative) identified by the appropriate units. Example: 0025-2PCT = 0.25 percent concentration
POPU	Total number of viable cells in the plating sample raised to some exponent printed directly below the abbreviation (i.e., EP + 6 = x 10^6).
MUT 1	Total number of mutants or convertants obtained from the sample plated raised to some exponent printed directly below the abbreviation (i.e., EP + 0 = 10^0). For strain D4, MUT 1 represents the number of ADE+ convertants.
MUT 2	Only used for strain D4 and represents the number of TRY+ convertants in the plated sample.
FREQ 1	The calculated mutation or gene conversion frequency times the negative exponent written directly below. For strain D4, FREQ 1 represents the ADE+ value.
FREQ 2	Only used for strain D4 and represents the TRY+ conversion frequency.
CONTAM	Presence of contamination on any plates.

DATA TABLE TERMS AND ABBREVIATIONS (continued)

ABBREVIATION OR TERM	DEFINITION OR EXPLANATION
AAF	2-Acetylaminofluorene
DMSO	Dimethylsulfoxide
DMN	Dimethylnitrosamine
EMS	Ethyl Methanesulfonate
QM	Quinacrine Mustard
NF	Nitrofluorene
SPECIES	Animal Strains
SPRDAW	Sprague Dawley Rats
ICRFLO	Flow ICR Random Bred Mice
RHESUS	Rhesus Monkey (*Macaca mulatta*)
MIXEDB	Dog, Mixed Breed
NEWZEA	New Zealand White Rabbit

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES / COMPOUND 007778770

TEST	ORG	TA1537 HIS EX-8	TA1538 HIS EX-8	TA1535 HIS EX-8	0000D4 ADE EX-5	0000D4 TRY EX-5
NAN		5.32	1.24	12.94	1.89	1.48
NAP		1764.20	922.93	771.32	129.05	155.87
NA1		6.67	2.04	3.57	1.54	1.69
NA2		6.77	1.67	3.03	0.76	1.14

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REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES ICRFLO/MOUSE COMPOUND 007778770

TEST	ORG	TA1537 HIS EX-8	TA1535 HIS EX-8	TA1538 HIS EX-8	TA1535 HIS EX-8	000004 ADE EX-5	000004 TRY EX-5
ACT	A+C	20.45		6.88	3.23	2.25	1.59
ACT	A+T	35.90		6.31	7.69	3.25	1.59
ACT	A-C	12.22	7.45	2.93	3.73	0.96	0.17
ACT	PLI	45.07		15.26	5496.88	7.59	6.16
ACT	PLU	20.50		4.48	4.79	2.42	2.60
ACT	PTE	28.79		2.33	9.15	3.81	2.06
ACT	LI1	37.82		7.38	6.29	2.27	1.89
ACT	LI2	11.39	6.06	5.85	22.34	1.61	3.03
ACT	LU1	5.98		3.75	5.50	1.80	2.20
ACT	LU2	11.62		3.91	3.94	1.86	1.86
ACT	TE1	22.38		4.07	2.86	3.26	2.34
ACT	TE2	23.86		3.77	4.18	2.08	2.08

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES SPRDAW/RAT COMPOUND 007778770

TEST	ORG	TA1535 HIS EX-8	TA1538 HIS EX-8	TA1537 HIS EX-8	000004 ADE EX-5	000004 TRY EX-5
ACT	A+C	4.48	4.75	10.86	2.65	2.37
ACT	A+T	2.48	6.57	10.31	3.90	3.90
ACT	A-C	5.52	9.05	8.87	2.94	3.03
ACT	PLI	333.15	20.33	17.19	7.37	9.16
ACT	PLU	6.11	8.76	14.09	3.32	19.54
ACT	PTE	8.60	6.77	11.40	3.84	4.23
ACT	LI1	2.17	11.53	9.77	1.98	1.72
ACT	LI2	2.95	10.87	8.47	3.06	2.45
ACT	LU1	5.65	8.94	10.54	2.14	2.05
ACT	LU2	5.49	8.49	11.50	2.65	2.47
ACT	TE1	3.91	14.46	11.05	3.59	3.04
ACT	TE2	5.26	4.64	13.72	3.58	2.08

LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES RHESUS/MONKEY COMPOUND 007778770

TEST	ORG	TA1537 HIS EX-8	TA1535 HIS EX-8	TA1538 HIS EX-8	000004 ADE EX-5	000004 TRY EX-5
ACT	A+C	6.36	4.50	10.43	1.82	1.82
ACT	A+T	3.92	5.62	5.80	2.59	2.73
ACT	A-C	5.63	7.72	2.70	2.16	1.80
ACT	PLI	10.56	1194.98	54.55	6.38	3.75
ACT	PLU	5.60	5.81	5.22	2.40	2.64
ACT	PTE	8.26	3.99	6.61	5.41	2.30
ACT	LI1	5.54	6.58	2.94	1.73	1.51
ACT	LI2	7.69	10.47	6.43	2.90	2.53
ACT	LU1	6.97	4.44	7.67	3.42	2.65
ACT	LU2	6.09	5.48	2.71	2.37	2.37
ACT	TE1	5.93	3.76	5.88	3.22	1.33
ACT	TE2	7.16	4.18	4.53	2.42	2.42

VI. INTERPRETATION OF RESULTS AND CONCLUSIONS

Compound 007778770, Monopotassium Phosphate Granular Food Grade was tested for genetic activity in a series of *in vitro* microbial assays with and without metabolic activation. The following results were obtained:

A. *Salmonella typhimurium*

1. Plate tests

At a concentration of 5.0%, 007778770, was not mutagenic for any of the bacterial indicator organisms in either direct or activation plate assays.

2. Nonactivation suspension tests

The results of these tests were negative.

3. Activation suspension tests

The results of these tests were considered negative. The mutant frequency for the LI2 dose with TA-1535, using mouse tissue was slightly increased, but a repeat test was negative. It was noted that the TA-1537 strain used in the test with mouse tissue had an unusually high spontaneous frequency. The data appeared acceptable.

B. *Saccharomyces cerevisiae*

1. Nonactivation suspension tests

The results of these tests were negative.

2. Activation suspension tests

The results of these tests were negative.

C. Conclusions

The test compound, Monopotassium Phosphate Granular Food Grade, did not exhibit genetic activity in the *in vitro* assays employed in this evaluation.

Submitted by:

David Brusick

David Brusick, Ph.D.
Director of Genetics

APPENDIX

Tabulation of Data

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 509802 DETECTOR TA1535 SPECIES / DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0487	0063	12.94	0
	NAP		EMS 0.002 %	0537	4142	771.32	0
007778770	NA1		0005-0 PCT.	0673	0024	3.57	0
007778770	NA2		0025-1 PCT.	0661	0020	3.03	0

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104
EXPERIMENT 511301 DETECTOR TA1537 SPECIES / PROJECT 02468

DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTJ EP+0	FREQ1 EP-8	CONTAM
	NAN		SALINE	0601	0032	5.32	0
	NAP		0M 1.0 UG/ML	0257	4534	1764.20	0
007778770	NA1		0005-0 PCT.	0300	0020	6.67	0
007778770	NA2		0025-1 PCT.	0325	0022	6.77	0

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104
EXPERIMENT 509803 DETECTOR TA1538 SPECIES / PROJECT 02468

DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU FP+6	MUTI FP+0	FREQ1 FP-8	CONTAM
	NAN		DMSO	0563	0007	1.24	0
	NAP		NF 125 UG-ML	0567	5233	922.93	0
007778770	NA1		0005-0 PCT.	0785	0016	2.04	2
007778770	NA2		0025-1 PCT.	0780	0013	1.67	0

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 514705 DETECTOR 000004 SPECIES / DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	NAN		SALINE	0741	0014	0011	1.89	1.48	0
	NAP		EMS 1.0 %	0179	0231	0279	129.05	155.87	0
007778770	NA1		0005-0 PCT.	0649	0010	0011	1.54	1.69	0
007778770	NA2		0025-1 PCT.	0788	0006	0009	0.76	1.14	0

LITTON BIONETICS

REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 509401 DETECTOR TA1535 SPECIES ICRFLO/MOUSE DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0650	0021	3.23	0
	A+T		***NO MATCH***	0156	0012	7.69	0
	A-C		SALINE	0670	0025	3.73	1
	ACP	LI	DMN 50 UM/ML	0096	5277	**5496.88**	0
	ACP	LU	DMN 50 UM/ML	0313	0015	4.79	0
	ACP	TE	DMN 50 UM/ML	0153	0014	9.15	0
007778770	ACT	LI1	0005-0 PCT.	0286	0018	6.29	0
007778770	ACT	LI2	0025-1 PCT.	0094	0021	22.34	0
007778770	ACT	LU1	0005-0 PCT.	0400	0022	5.50	2
007778770	ACT	LU2	0025-1 PCT.	0381	0015	3.94	0
007778770	ACT	TE1	0005-0 PCT.	0384	0011	2.86	0
007778770	ACT	TE2	0025-1 PCT.	0311	0013	4.18	0

BIONETICS

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 517803 DETECTOR TA1535 SPECIES ICRFLD/MOUSE DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A-C		SALINE	0738	0055	7.45	0
007778770	ACT	LI2	0025-1 PCT.	0611	0037	6.06	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104
EXPERIMENT 517602 DETECTOR TA1537 SPECIES ICRFLO/MOUSE PROJECT 02468 DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0308	0063	20.45	0
	A+T		***NO MATCH***	0078	0028	35.90	1
	A-C		DMSO	0483	0059	12.22	0
	ACP	LI	AAF 800 UG/ML	0071	0032	45.07	1
	ACP	LU	AAF 800 UG/ML	0161	0033	20.50	0
	ACP	TE	AAF 800 UG/ML	0198	0057	28.79	0
007778770	ACT	LI1	0005-0 PCT.	0156	0059	37.82	0
007778770	ACT	LI2	0025-1 PCT.	0404	0046	11.39	0
007778770	ACT	LU1	0005-0 PCT.	0669	0040	5.98	0
007778770	ACT	LU2	0025-1 PCT.	0396	0046	11.62	0
007778770	ACT	TF1	0005-0 PCT.	0143	0032	22.38	0
007778770	ACT	TF2	0025-1 PCT.	0197	0047	23.86	2

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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 509701 DETECTOR TA1538 SPECIES ICRFLO/MOUSE DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0858	0059	6.88	0
	A+T		***NO MATCH***	0666	0042	6.31	0
	A-C		DMSO	0819	0024	2.93	0
	ACP	LI	AAF 800 UG/ML	0675	0103	15.26	0
	ACP	LU	AAF 800 UG/ML	1026	0046	4.48	2
	ACP	TE	AAF 800 UG/ML	0945	0022	2.33	0
007778770	ACT	LI1	0005-0 PCT.	0420	0031	7.38	0
007778770	ACT	LI2	0025-1 PCT.	0513	0030	5.85	2
007778770	ACT	LU1	0005-0 PCT.	0587	0022	3.75	2
007778770	ACT	LU2	0025-1 PCT.	0690	0027	3.91	0
007778770	ACT	TE1	0005-0 PCT.	0615	0025	4.07	0
007778770	ACT	TE2	0025-1 PCT.	0637	0024	3.77	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 512601 DETECTOR 000004 SPECIES ICRFLD/MOUSE DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0755	0017	0012	2.25	1.59	0
	A+T		***NO MATCH***	1260	0041	0020	3.25	1.59	6
	A-C		SALINE	1145	0011	0002	0.96	0.17	0
	ACP	LI	DMN 90 UM/ML	0909	0069	0056	7.59	6.16	6
	ACP	LU	DMN 90 UM/ML	1117	0027	0029	2.42	2.60	0
	ACP	TE	DMN 90 UM/ML	0970	0037	0020	3.81	2.06	6
007778770	ACT	LI1	0005-0 PCT.	1056	0024	0020	2.27	1.89	6
007778770	ACT	LI2	0025-1 PCT.	1055	0017	0032	1.61	3.03	0
007778770	ACT	LU1	0005-0 PCT.	1002	0018	0022	1.80	2.20	0
007778770	ACT	LU2	0025-1 PCT.	0969	0018	0018	1.86	1.86	0
007778770	ACT	TE1	0005-0 PCT.	0982	0032	0023	3.26	2.34	6
007778770	ACT	TE2	0025-1 PCT.	1248	0026	0026	2.08	2.08	4

LITTON BIONETICS

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 510801 DETECTOR TA1535 SPECIES SPRDAW/RAT DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		DMN 50 UM/ML	0692	0031	4.48	0
	A+T		***NO MATCH***	0483	0012	2.48	3
	A-C		SALINE	0725	0040	5.52	0
	ACP	LI	DMN 50 UM/ML	0368	1226	333.15	1
	ACP	LU	DMN 50 UM/ML	0311	0019	6.11	0
	ACP	TE	DMN 50 UM/ML	0349	0030	8.60	0
007778770	ACT	LI1	0005-0 PCT.	0736	0016	2.17	2
007778770	ACT	LI2	0025-1 PCT.	0577	0017	2.95	2
007778770	ACT	LU1	0005-0 PCT.	0673	0038	5.65	0
007778770	ACT	LU2	0025-1 PCT.	0565	0031	5.49	0
007778770	ACT	TE1	0005-0 PCT.	0716	0028	3.91	0
007778770	ACT	TE2	0025-1 PCT.	0494	0026	5.26	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104
EXPERIMENT 511501 DETECTOR TA1537 SPECIES SPRDAW/RAT PROJECT 02468

DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0663	0072	10.86	0
	A+T		***NO MATCH***	0446	0046	10.31	0
	A-C		DMSO	0688	0061	8.87	0
	ACP	LI	AAF 800 UG/ML	0512	0088	17.19	2
	ACP	LU	AAF 800 UG/ML	0589	0083	14.09	0
	ACP	TE	AAF 800 UG/ML	0544	0062	11.40	0
007778770	ACT	LI1	0005-0 PCT.	0522	0051	9.77	1
007778770	ACT	LI2	0025-1 PCT.	0484	0041	8.47	0
007778770	ACT	LU1	0005-0 PCT.	0503	0053	10.54	0
007778770	ACT	LU2	0025-1 PCT.	0452	0052	11.50	0
007778770	ACT	TE1	0005-0 PCT.	0353	0039	11.05	0
007778770	ACT	TE2	0025-1 PCT.	0379	0052	13.72	0

BIONETICS

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 511801 DETECTOR TA1538 SPECIES SPRDAW/RAT DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0926	0044	4.75	0
	A+T		***NO MATCH***	0792	0052	6.57	0
	A-C		DMSO	0707	0064	9.05	0
	ACP	LI	AAF 800 UG/ML	0718	0146	20.33	2
	ACP	LU	AAF 800 UG/ML	0833	0073	8.76	0
	ACP	TE	AAF 800 UG/ML	0886	0060	6.77	2
007778770	ACT	LI1	0005-0 PCT.	0425	0049	11.53	0
007778770	ACT	LI2	0025-1 PCT.	0497	0054	10.87	3
007778770	ACT	LU1	0005-0 PCT.	0470	0042	8.94	0
007778770	ACT	LU2	0025-1 PCT.	0636	0054	8.49	0
007778770	ACT	TE1	0005-0 PCT.	0332	0048	14.46	0
007778770	ACT	TE2	0025-1 PCT.	1077	0050	4.64	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 517805 DETECTOR 000004 SPECIES SPRDAW/RAT DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1 EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	1055	0028	0025	2.65	2.37	0
	A+T		***NO MATCH***	0999	0039	0039	3.90	3.90	0
	A-C		SALINE	1089	0032	0033	2.94	3.03	1
	ACP	LI	DMN 90 UM/ML	1234	0091	0113	7.37	9.16	0
	ACP	LU	DMN 90 UM/ML	1295	0043	0253	3.32	19.54	6
	ACP	TE	DMN 90 UM/ML	1016	0039	0043	3.84	4.23	6
007778770	ACT	LI1	0005-0 PCT.	1160	0023	0020	1.98	1.72	7
007778770	ACT	LI2	0025-1 PCT.	1142	0035	0028	3.06	2.45	7
007778770	ACT	LU1	0005-0 PCT.	1169	0025	0024	2.14	2.05	7
007778770	ACT	LU2	0025-1 PCT.	1095	0029	0027	2.65	2.47	7
007778770	ACT	TE1	0005-0 PCT.	0920	0033	0028	3.59	3.04	7
007778770	ACT	TE2	0025-1 PCT.	0866	0031	0018	3.58	2.08	7

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104
EXPERIMENT 509901 DETECTOR TA1535 SPECIES RHESUS/MONKEY PROJECT 02468 DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUTI EP+0	FREQI EP-8	CONTAM
	A+C		DMN 50 UM/ML	0756	0034	4.50	0
	A+T		***NO MATCH***	0534	0030	5.62	0
	A-C		SALINE	0479	0037	7.72	1
	ACP	LI	DMN 50 UM/ML	0458	5473	**1194.98**	0
	ACP	LU	DMN 50 UM/ML	0551	0032	5.81	0
	ACP	TE	DMN 50 UM/ML	0426	0017	3.99	2
007778770	ACT	LI1	0005-0 PCT.	0562	0037	6.58	0
007778770	ACT	LI2	0025-1 PCT.	0363	0038	10.47	0
007778770	ACT	LU1	0005-0 PCT.	0653	0029	4.44	0
007778770	ACT	LU2	0025-1 PCT.	0621	0034	5.48	0
007778770	ACT	TE1	0005-0 PCT.	0638	0024	3.76	2
007778770	ACT	TE2	0025-1 PCT.	0526	0022	4.18	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104
EXPERIMENT 511901 DETECTOR TA1537 SPECIES RHESUS/MONKEY PROJECT 02468

DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0692	0044	6.36	0
	A+T		***NO MATCH***	0638	0025	3.92	0
	A-C		DMSO	0533	0030	5.63	0
	ACP	LI	AAF 800 UG/ML	0606	0064	10.56	0
	ACP	LU	AAF 800 UG/ML	0643	0036	5.60	0
	ACP	TE	AAF 800 UG/ML	0545	0045	8.26	0
007778770	ACT	LI1	0005-0 PCT.	0596	0033	5.54	0
007778770	ACT	LI2	0025-1 PCT.	0546	0042	7.69	0
007778770	ACT	LU1	0005-0 PCT.	0416	0029	6.97	0
007778770	ACT	LU2	0025-1 PCT.	0509	0031	6.09	0
007778770	ACT	TE1	0005-0 PCT.	0371	0022	5.93	0
007778770	ACT	TE2	0025-1 PCT.	0377	0027	7.16	0

LITTON BIONETICS

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104 PROJECT 02468
EXPERIMENT 510001 DETECTOR TA1538 SPECIES RHESUS/MONKEY DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+6	MUT1 EP+0	FREQ1 EP-8	CONTAM
	A+C		AAF 800 UG/ML	0748	0078	10.43	0
	A+T		***NO MATCH***	0742	0043	5.80	2
	A-C		DMSO	0742	0020	2.70	2
	ACP	LI	AAF 800 UG/ML	0638	0348	54.55	0
	ACP	LU	AAF 800 UG/ML	0901	0047	5.22	0
	ACP	TE	AAF 800 UG/ML	0681	0045	6.61	0
007778770	ACT	LI1	0005-0 PCT.	1123	0033	2.94	3
007778770	ACT	LI2	0025-1 PCT.	0591	0038	6.43	2
007778770	ACT	LU1	0005-0 PCT.	0430	0033	7.67	0
007778770	ACT	LU2	0025-1 PCT.	0887	0024	2.71	0
007778770	ACT	TE1	0005-0 PCT.	0476	0028	5.88	1
007778770	ACT	TE2	0025-1 PCT.	0596	0027	4.53	2

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104
EXPERIMENT 514202 DETECTOR 0000D4 SPECIES RHESUS/MONKEY PROJECT 02468
DATE - 07/08/75

COMPOUND	TEST	ORG ID	CONCENTRATION	POPU EP+4	MUT1. EP+1	MUT2 EP+1	FREQ1 EP-5	FREQ2 EP-5	CONTAM
	A+C		DMN 90 UM/ML	0658	0012	0012	1.82	1.82	1
	A+T		***NO MATCH***	0695	0018	0019	2.59	2.73	1
	A-C		SALINE	0555	0012	0010	2.16	1.80	7
	ACP	LI	DMN 90 UM/ML	0799	0051	0030	6.38	3.75	0
	ACP	LU	DMN 90 UM/ML	0832	0020	0022	2.40	2.64	1
	ACP	TE	DMN 90 UM/ML	0739	0040	0017	5.41	2.30	4
007778770	ACT	LI1	0005-0 PCT.	0927	0016	0014	1.73	1.51	5
007778770	ACT	LI2	0025-1 PCT.	0829	0024	0021	2.90	2.53	1
007778770	ACT	LU1	0005-0 PCT.	0906	0031	0024	3.42	2.65	1
007778770	ACT	LU2	0025-1 PCT.	0972	0023	0023	2.37	2.37	5
007778770	ACT	TE1	0005-0 PCT.	0900	0029	0012	3.22	1.33	1
007778770	ACT	TE2	0025-1 PCT.	0826	0020	0020	2.42	2.42	0